

IN THE CLAIMS:

Please note that all claims currently pending and under consideration in the referenced application are shown below, in clean form, for clarity.

*Sub C1*

~~25. (Amended) A fluorescence assay, comprising the steps of:~~  
~~providing a waveguide which is optically conductive and which has at least one surface having a plurality of capture oligonucleotides site-specifically immobilized thereon, wherein said capture oligonucleotides have a binding site which selectively binds a selected analyte;~~  
~~providing a light source operable to emit a light beam in a desired wavelength range and positioned to send light into the waveguide;~~  
~~providing detection means operably disposed for detecting fluorescence emitted from the waveguide;~~  
~~providing a sample comprising a buffer and a plurality of molecules of a selected analyte;~~  
~~providing a plurality of tracer molecules which are operable to emit fluorescence in response to stimulation by light from the light source;~~  
~~combining the sample with the tracer molecules to produce a test solution;~~  
~~placing the test solution in contact with the waveguide surface while operating said light source to direct light into the waveguide; and~~  
~~selectively detecting fluorescent light emitted from the tracer molecules.~~

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~~26. (Amended) The assay of Claim 25, wherein said step of providing a waveguide with site-specifically immobilized capture oligonucleotides includes the steps of:~~  
~~coating the waveguide surface with a first coating to produce a coated surface;~~  
~~providing a plurality of capture oligonucleotides;~~  
~~modifying a single moiety which is the same on each capture molecule, to produce activated capture oligonucleotides having a modified moiety constructed to be coupled to the first coating; and~~  
~~treating the coated surface with the activated capture oligonucleotides under conditions to cause the modified moiety to couple to the first coating and thereby immobilize the activated capture oligonucleotides to the waveguide surface.~~

27. (Amended) The assay of Claim 25, wherein said first coating is selected from the group consisting of: avidin, biotin, a hydrogel formed of polymethacryloyl polymers, and a modified polyethylene glycol.

28. (Amended) The assay of Claim 25, wherein an oligonucleotide primer acting as a capture oligonucleotide complementary to said analyte is immobilized to said waveguide by amine-reactive, thiol-reactive, or (strep) avidin-biotin coupling chemistry.

29. (Amended) The assay of Claim 25, wherein said tracer molecules are complementary to a second sequence of said analyte.

Please add the following claims:

30. (New) An immunofluorescence assay, comprising the steps of:  
providing a step-gradient waveguide which is optically conductive and which has at least one surface having a plurality of capture molecules site-specifically immobilized thereon, said capture molecules having a binding site which selectively binds a selected analyte;  
providing a light source operable to emit a light beam in a desired wavelength range and positioned to send light into the waveguide;  
providing detection means operably disposed for detecting fluorescence emitted from the step-gradient waveguide;  
providing a sample comprising a buffer and a plurality of molecules of a selected analyte;  
providing a plurality of tracer molecules which are operable to emit fluorescence in response to stimulation by light from the light source;  
combining the sample with the tracer molecules to produce a test solution;  
placing the test solution in contact with the step-gradient waveguide surface while operating said light source to direct light into the step-gradient waveguide; and  
selectively detecting fluorescent light emitted from the tracer molecules.

31. (New) The assay of Claim 25, wherein said step of providing a step-gradient waveguide with site-specifically immobilized capture molecules includes the steps of: coating the step-gradient waveguide surface with a first coating to produce a coated surface; providing a plurality of capture molecules; modifying a single moiety which is the same on each capture molecule, to produce activated capture molecules having a modified moiety constructed to be coupled to the first coating; and treating the coated surface with the activated capture molecules under conditions to cause the modified moiety to couple to the first coating and thereby immobilize the activated capture molecules to the step-gradient waveguide surface.

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32. (New) The assay of Claim 25, wherein said first coating is selected from the group consisting of: avidin, a hydrogel formed of polymethacryloyl polymers, and a modified polyethylene glycol.

33. (New) The assay of Claim 25, wherein an oligonucleotide primer acting as a capture molecule complementary to said analyte is immobilized to said step-gradient waveguide by amine-reactive, thiol-reactive, or (strept) avidin-biotin coupling chemistry.

34. (New) The assay of Claim 25, wherein said tracer molecules are complementary to a second sequence of said analyte.

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